**What Is Claimed Is:**

1. An apparatus for reclaiming fuel oil from waste oil, comprising:

an airtight thermal cracking vessel;

a waste oil tank for storing waste oils to be supplied into the thermal cracking vessel;

pressurizing means for elevating the pressure inside the thermal cracking vessel;

a vacuum pump for maintaining a vacuum pressure inside the thermal cracking vessel;

a high pressure relief valve for releasing excessive high pressure gas from the thermal cracking vessel;

heaters uniformly distributed around the thermal cracking vessel for heating the waste oil within the thermal cracking vessel without making any different temperature zones; and

a bleeding valve, disposed at the bottom of the thermal cracking vessel, for the removal of solidifying ash cake.

2. The apparatus according to claim 1, further comprising:

a rupture valve which can be blown up for the emergency case of excessive pressure inside the thermal cracking vessel; and

a safety tank, connected to the rupture valve and physically apart from the thermal cracking vessel, for storing the waste oil escaped from the thermal cracking vessel.

3. The apparatus according to claim 1, further comprising:

a storage tank for storing waste oil containing the ash cake flowing from the bleeding valve; and

recycling means, connected to the storage tank, for recycling the waste oil within the storage tank back to the waste oil tank.

4. The apparatus according to claim 1, wherein the pressurizing means comprises:

a pump for feeding waste oil from the waste oil tank to the thermal cracking vessel; and

an argon gas tank connected to the thermal cracking vessel.

5. The apparatus according to claim 1, further comprising:

a level gauge for measuring the level of residual waste oil in the thermal cracking vessel; and

a temperature probe for measuring the temperature of waste oil in the thermal cracking vessel.

6. The apparatus according to claim 5, further comprising a PLC for controlling valves, a probe, heaters, a gauge and a pump.

7. A process for reclaiming fuel oil from waste oil, comprising the steps of:

(a) increasing the pressure inside a thermal cracking vessel up to 50 ~ 100 psi by feeding waste oil to the thermal cracking

vessel using a high pressure pump;

(b) heating the thermal cracking vessel until the temperature inside the thermal cracking vessel reaches about 200 °C;

(c) slightly opening the thermal cracking vessel to release any trapped air in the vessel to the atmosphere and closing the vessel;

(d) heating the thermal cracking vessel to maintain the temperature inside the thermal cracking vessel at a constant value in the range of 300 ~ 350 °C until about 50% of the waste oil is removed from the vessel by thermal cracking;

(e) stopping heating and depressurizing the thermal cracking vessel at least up to $10^{-6}$ torr; and

(f) removing vacuum pressure inside the thermal cracking vessel when about 70% of the waste oil goes through thermal cracking.

8. The process according to claim 7, further comprising the step of pre-pressurizing the thermal cracking vessel up to 100 ~ 150 psi using argon gas before the (b) step.

9. The process according to claim 7, wherein the waste oil is filled up 70 ~ 80% of the thermal cracking vessel volume in the (a) step.

10. The process according to claim 7, wherein the bottom

of the thermal cracking vessel slightly opens to remove solidifying ash cake during the (a) ~ (d) steps.